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CLAIMS

1. A bending wave loudspeaker having an operating frequency range and a coincidence frequency which is above the operating frequency range, comprising a resonant panel having two generally orthogonal axes, vibration exciting means coupled to the panel to excite the panel into resonance along the one axis of the panel, and means restraining or preventing resonance along the other axis of the panel whereby the panel radiates an acoustic output which is of wide directivity along the one axis and of narrow directivity along the other axis of the panel.

2. A loudspeaker according to claim 1, wherein the panel is rectangular.

3. A loudspeaker according to claim 1 or claim 2, wherein the vibration exciting means forms the means restraining or preventing resonance along the other axis.

4. A loudspeaker according to claim 3, wherein the coupling of the vibration exciting means to the panel is longer than the wavelength of sound in air at the lowest required frequency.

5. A loudspeaker according to any preceding claim, wherein the vibration exciting means comprises a line of discrete exciters extending along the other axis and operated substantially in phase.

6. A loudspeaker according to claim 5, wherein the spacing between the exciters is not substantially greater

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than half the wavelength in the panel at the highest

operating frequency.

7.   A loudspeaker according to claim 5 or claim 6, wherein

the line is rectilinear.

5   8.   A loudspeaker according to any one of claims 5 to 7,

wherein the line extends substantially from one end of the

panel to the other end.

9.   A loudspeaker according to any one of claims 5 to 8,

wherein there are at least four exciters in the line.

10   10.   A loudspeaker according to any one of claims 5 to 9,

wherein the line of exciters is to one side of the median

longitudinal axis of the panel.

11.   A loudspeaker according to claim 10, wherein the line

is on the nodal line of the first lateral bending mode.

15   12.   A loudspeaker according to any one of claims 5 to 11,

wherein the exciters are equally spaced along the line.

13.   A loudspeaker according to any preceding claim,

wherein the panel is rectangular, with a main or major

axis, and correspondingly a cross or minor axis, and with

20   an aspect ratio of at least 2: 1.

14.   A loudspeaker according to any one of claims 5 to 13,

wherein the exciter spacing d in the line and the bending

stiffness B and areal density μ of the panel substantially

conform to the formula:-

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$$\frac{B}{\mu} = \left(\frac{cd}{\pi}\right)^2$$